CLAIMS

1. (Currently amended) A method for quantitative determination of arsenic concentration in a water sample in the field, wherein the water sample comprises phosphates that have an order of magnitude or more higher concentration than the arsenic concentration, the method comprising:

(a) preparing a first and a second water sample aliquot;

(b) adding a reducing agent to a the first water sample aliquot to reduce arsenic in the aliquot to an arsenite state, whereas the second water sample aliquot is unreduced;

(c) adding a color reagent to the first and second sample aliquots, whereby phosphates in the first aliquot and both phosphates and arsenates in the second aliquot are converted into color complexes;

(d) using optical probes to measure light absorbance of the color complexes formed in each aliquot; and

(e) using the measured light absorbances for the two aliquots to ~~calculate~~ determine the arsenic concentration in the groundwater sample,

wherein the optical probes are disposed in a portable battery-powered colorimeter, and wherein the determination of the arsenic concentration has a detection limit of 10 μg/L or lower for groundwater samples having phosphate concentrations in the range of 5-50 μM.

2. (Original) The method of claim 1, further comprising the step of adding an oxidizing agent to the second sample aliquot to oxidize arsenic in the aliquot to an arsenate state.

3. (Original) The method of claim 1 wherein the optical probe comprises infrared radiation having a wavelength of about 880 nm.

4. (Original) The method of claim 1 wherein the color complexes comprise molybdenum blue.

5. (Original) The method of claim 4 wherein the color reagent comprises potassium antimonyl tartrate, wherein the water sample is a groundwater sample, and wherein the proportion of color reagents added to groundwater sample aliquots is increased by about a factor of 10 over conventional Johnson and Pilson formulations used for seawater analysis.

6. (Original) The method of claim 1 wherein an optical probe comprises:

a cuvette to hold a sample aliquot;

a light emitting diode which is configured to radiate light on to the cuvette;

a photodetector for measuring the intensity of light transmitted through the held sample aliquot; and

an electronic component to process the voltage output of the photo detector.

7. (Original) The method of claim 1 wherein using optical probes comprises using a pair of optical probes that are disposed in a dual-beam arrangement in the portable colorimeter, and using a first probe in the pair to measure light absorbance in the first sample aliquot, and the second probe in the pair to measure light absorbance in the second sample aliquot.

8. (Original) The method of claim 7 wherein the responses of the optical probes in the pair are normalized with respect to each other.

9. (Original) The method of claim 1 wherein the light absorbance in the first and the second sample aliquots is measured sequentially.

10. (Original) The method of claim 1 wherein the light absorbance in the first and second sample aliquots is measured concurrently.

11. - 18. (Cancelled).